Sustainability 401

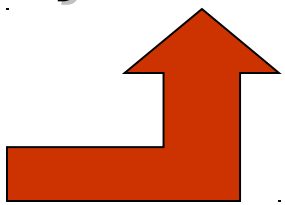
Part 2: The Future in a Word… Sustainability

October 30

Fort Lewis, WA

Learning Objectives

- *There's a problem – we are exceeding the earth's capacity to provide resources and absorb wastes*
- *There's a solution – "sustainability" is a framework that balances economy (mission), well-being, and environment*



We Are Here

- *See what some visionary organizations are doing*
- *Still saving the world and having fun*

Origins of Sustainability

i.e., it's not something we made up to torture you …

- **Communities**
- **Regional Programs**
- **State Initiatives**
- **Federal programs**
- **Corporations and industry**

Communities

- **Whistler, British Columbia**
- **Sustainable Pittsburgh**
- **City of Austin Sustainable Communities Initiative**
- **Chattanooga Venture**
- **The Livable Tucson Program**
- **Sustainable Seattle**
- **Sustainable City, San Francisco**
- **Sustainable Boston Initiative**

Regional Programs

- **Thomas Jefferson Sustainability Council**
- **Sustainability Indicators Project for Central Texas**
- **Clinch Powell Sustainable Development Initiative**
- **Greater Orlando Region Healthy Communities Initiative**

State Initiatives

- **Sustainable Washington**
- **Smart Growth for Colorado's Future**
- **Maryland Smart Growth Program**
- **North Carolina Environmental Sustainability Plan**
- **Florida Sustainable Communities**

Federal Programs

- **President's Council on Sustainable Development**
- **EPA Smart Growth Network**
- **EPA Green Communities**
- **Federal Highway Administration Transportation and Community and System Preservation Program**
- **U.S. Interagency Working Group Sustainable Development Indicators**
- **Department of Energy, Center of Excellence in Sustainable Development**
- **Federal Sustainability Network**

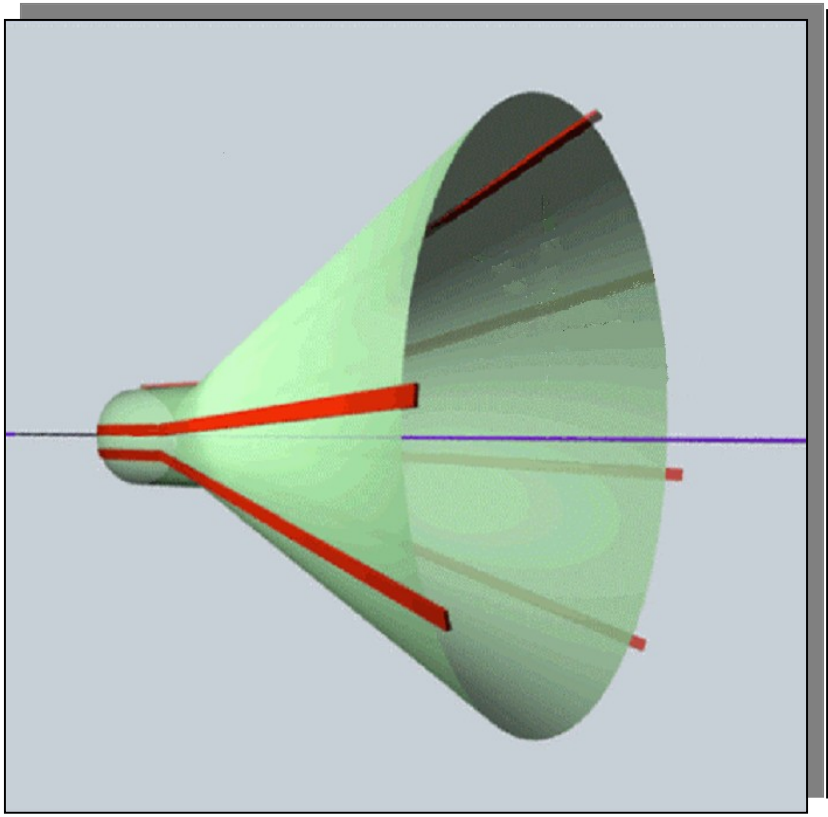
Corporate Programs

- **Nike**
- **Starbucks**
- **Interface**
- **British Petroleum**
- **General Motors Corporation**
- **Saunders Hotel Group**
- **SwissHôtel**
- **Silicon Valley Manufacturing Group**
- **Ford Motor Company**
- **Scandic Hotels**
- **Collins Pine**

The United States Army – The Journey Begun

- **Facilities**
  - **Sustainable Design and Development Policy**
  - **SPiRiT standards**
- **Ranges**
  - **Sustainable Range Design R&D Program**
- **Weapons Systems**
  - **Green ammunition R&D program**
- **Installations**
  - **Installation Sustainability Program**
  - **Army Compatible Use Buffers/Private Lands Initiatives**

The Other Side



Sustainability - Multiple approac

Eco-efficiency
Natural Capitalism
Factor Four, Factor Ten
Biomimicry
Eco-effectiveness
Dematerialization
The Natural Step Framework

More slides from Mary and Brian Nattrass, Directors of The Natural Step Canada, and authors of…

Dancing with the Tiger

Learning sustainability Step by Natural Step

Why The Natural Step Framew

- Derived from fundamental scientif principles
- Simplifies the complexity of syste environmental issues
- Provides a framework for planning action
- Takes a systems perspective

The Rules of This System

Closed with respect to matter

Open with respect to energy

Basic Science – all scientists agree

Matter and energy become less ordered, concentrated, and structured.

The quality (usefulness) of matter and energy decreases as it becomes less ordered etc.

Photosynthesis is the major process by which order is produced.

Basic Science - Demonstration

WHO NEEDS SOME CHOCOLATE?

Basic Science – all scientists agree

Matter and energy become less ordered, concentrated, and structured.

The quality (usefulness) of matter and energy decreases as it becomes less ordered etc.

Photosynthesis is the major process by which order is produced.

Dancing with the Tiger

Learning sustainability Step by Natural Step

System Condition 1

In a sustainable society, nature is not subject to systematically increasing:

… concentrations of substances extracted from the Earth’s crust.

What does this mean?
Who’s got an example?

System Condition 2

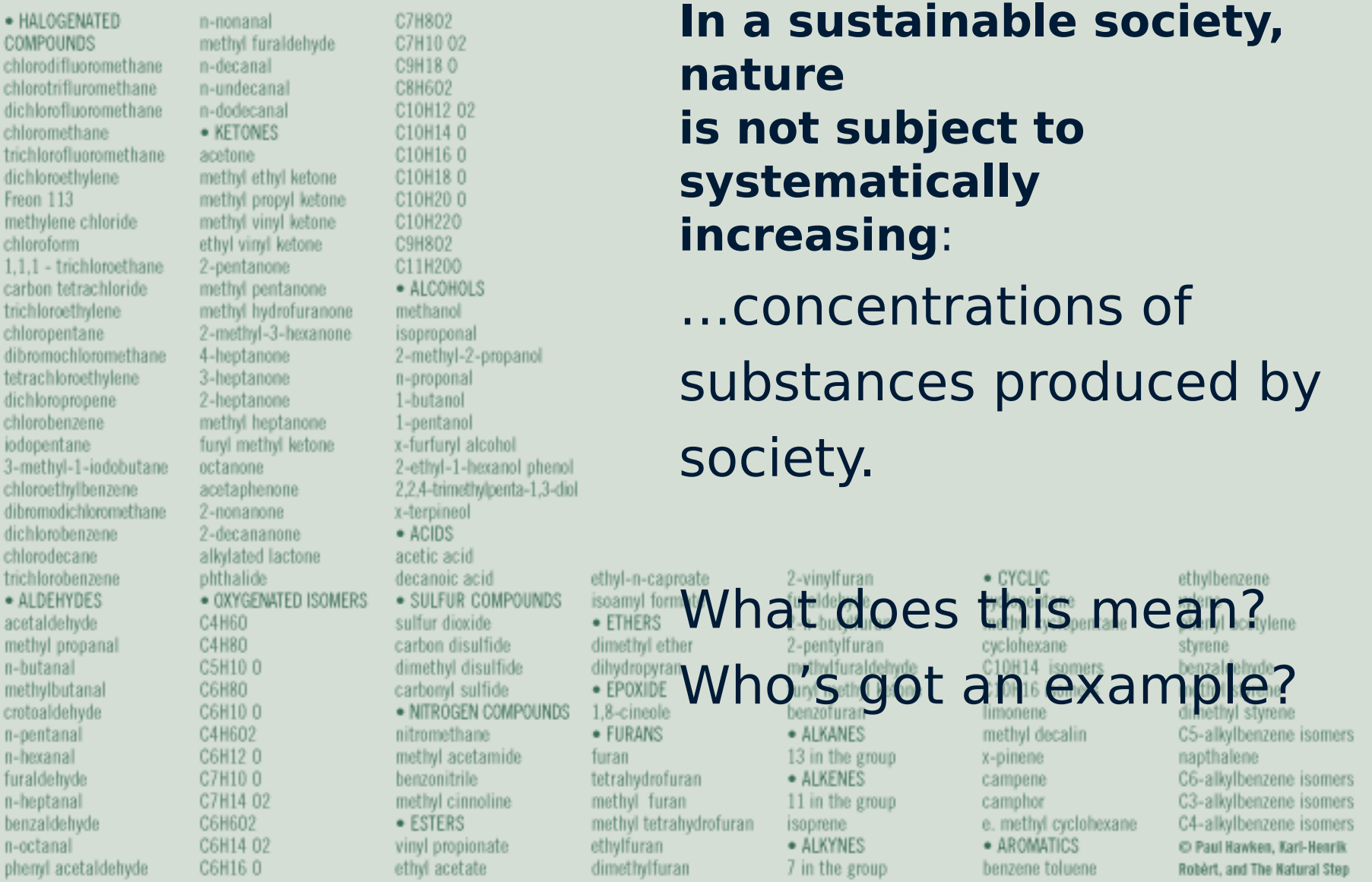
the NATURAL STEP

In a sustainable society, nature is not subject to systematically increasing:

…concentrations of substances produced by society.

What does this mean?

Who's got an example?



• HALOGENATED COMPOUNDS
chlorodifluoromethane
chlorotrifluromethane
dichlorofluoromethane
chloromethane
trichlorofluoromethane
dichloroethylene
Freon 113
methylene chloride
chloroform
1,1,1 - trichloroethane
carbon tetrachloride
trichloroethylene
chloropentane
dibromochloromethane
tetrachloroethylene
dichloropropene
chlorobenzene
iodopentane
3-methyl-1-iodobutane
chloroethylbenzene
dibromodichloromethane
dichlorobenzene
chlorodecane
trichlorobenzene
• ALDEHYDES
acetaldehyde
methyl propanal
n-butanal
methylbutanal
crotoaldehyde
n-pentanal
n-hexanal
furaldehyde
n-heptanal
benzaldehyde
n-octanal
phenyl acetaldehyde
n-nonanal
methyl furaldehyde
n-decanal
n-undecanal
n-dodecanal
• KETONES
acetone
methyl ethyl ketone
methyl propyl ketone
methyl vinyl ketone
ethyl vinyl ketone
2-pentanone
methyl pentanone
methyl hydrofuranone
2-methyl-3-hexanone
4-heptanone
3-heptanone
2-heptanone
methyl heptanone
furyl methyl ketone
octanone
acetaphenone
2-nonanone
2-decananone
alkylated lactone
phthalide
• OXYGENATED ISOMERS
C4H6O
C4H8O
C5H10 O
C6H8O
C6H10 O
C4H6O2
C6H12 O
C7H10 O
C7H14 O2
C6H6O2
C6H14 O2
C6H16 O
C7H8O2
C7H10 O2
C9H18 O
C8H6O2
C10H12 O2
C10H14 O
C10H16 O
C10H18 O
C10H20 O
C10H22O
C9H8O2
C11H20O
• ALCOHOLS
methanol
isoproponal
2-methyl-2-propanol
n-proponal
1-butanol
1-pentanol
x-furfuryl alcohol
2-ethyl-1-hexanol phenol
2,2,4-trimethylpenta-1,3-diol
x-terpineol
• ACIDS
acetic acid
decanoic acid
• SULFUR COMPOUNDS
sulfur dioxide
carbon disulfide
dimethyl disulfide
carbonyl sulfide
• NITROGEN COMPOUNDS
nitromethane
methyl acetamide
benzonitrile
methyl cinnoline
• ESTERS
vinyl propionate
ethyl acetate
ethyl-n-caproate
isoamyl formate
• ETHERS
dimethyl ether
dihydropyran
• EPOXIDE
1,8-cineole
• FURANS
furan
tetrahydrofuran
methyl furan
methyl tetrahydrofuran
ethylfuran
dimethylfuran
2-vinylfuran
2-pentylfuran
methylfuraldehyde
benzofuran
• ALKANES
13 in the group
• ALKENES
11 in the group
isoprene
• ALKYNES
7 in the group
• CYCLIC
cyclohexane
C10H14 isomers
limonene
methyl decalin
x-pinene
campene
camphor
e. methyl cyclohexane
• AROMATICS
benzene toluene
ethylbenzene
styrene
dimethyl styrene
C5-alkylbenzene isomers
napthalene
C6-alkylbenzene isomers
C3-alkylbenzene isomers
C4-alkylbenzene isomers
© Paul Hawken, Karl-Henrik Robèrt, and The Natural Step

System Condition 3

In a sustainable society, nature is not subject to increasing:

… degradation by physical means.

What does this mean?

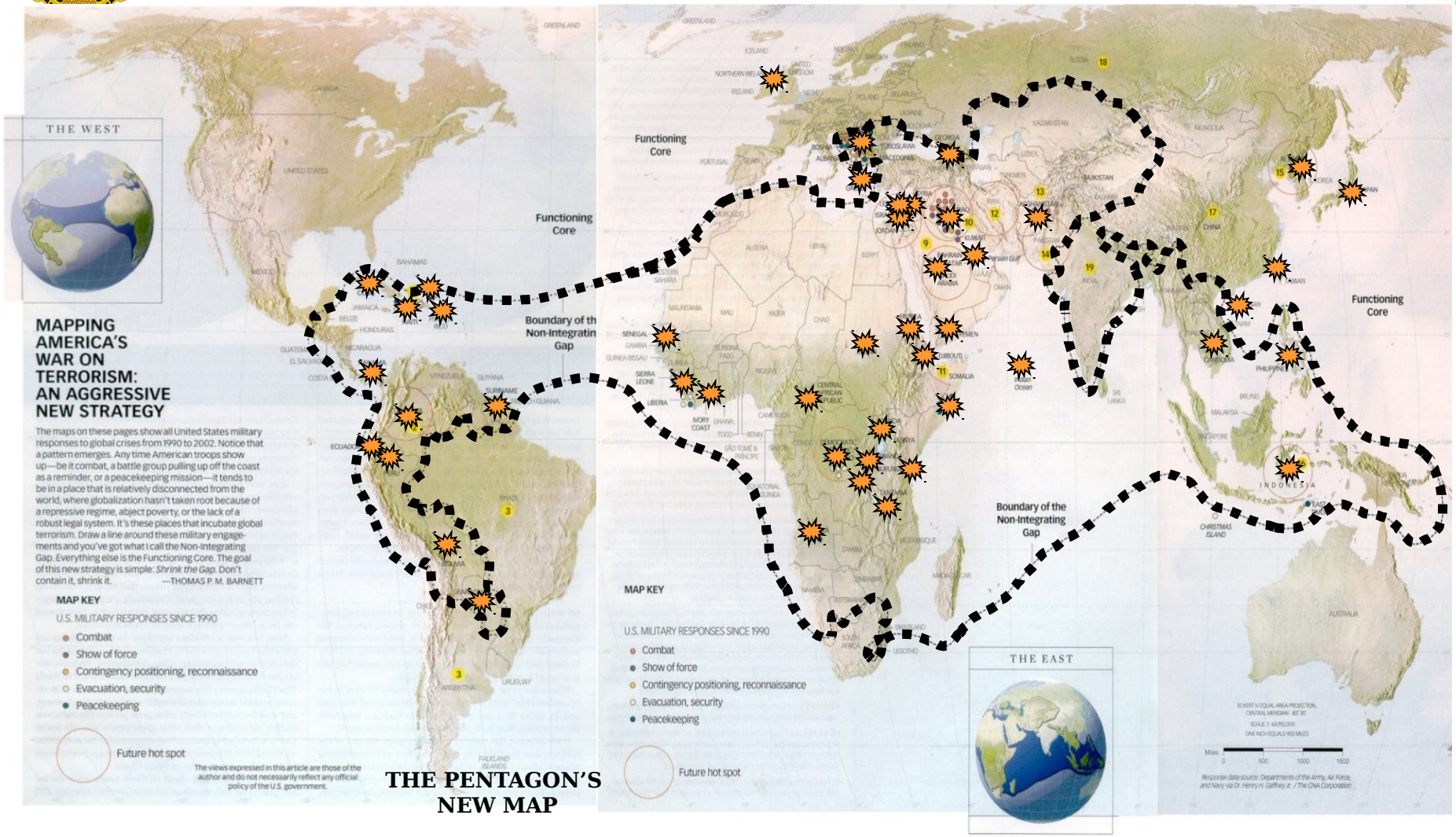
Who’s got an example?

System Condition 4

In a sustainable society:

Basic needs are met worldwide.

What does this mean?
Who’s got an example?


THE WEST
MAPPING AMERICA'S WAR ON TERRORISM: AN AGGRESSIVE NEW STRATEGY
The maps on these pages show all United States military responses to global crises from 1990 to 2002. Notice that a pattern emerges. Any time American troops show up—be it combat, a battle group pulling up off the coast as a reminder, or a peacekeeping mission—it tends to be in a place that is relatively disconnected from the world, where globalization hasn't taken root because of a repressive regime, abject poverty, or the lack of a robust legal system. It's these places that incubate global terrorism. Draw a line around these military engagements and you've got what I call the Non-Integrating Gap. Everything else is the Functioning Core. The goal of this new strategy is simple: Shrink the Gap. Don't contain it, shrink it. —THOMAS P. M. BARNETT
MAP KEY
U.S. MILITARY RESPONSES SINCE 1990
Combat
Show of force
Contingency positioning, reconnaissance
Evacuation, security
Peacekeeping
Future hot spot
The views expressed in this article are those of the author and do not necessarily reflect any official policy of the U.S. government.
Functioning Core
Boundary of the Non-Integrating Gap
Functioning Core
Boundary of the Non-Integrating Gap
MAP KEY
U.S. MILITARY RESPONSES SINCE 1990
Combat
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THE EAST

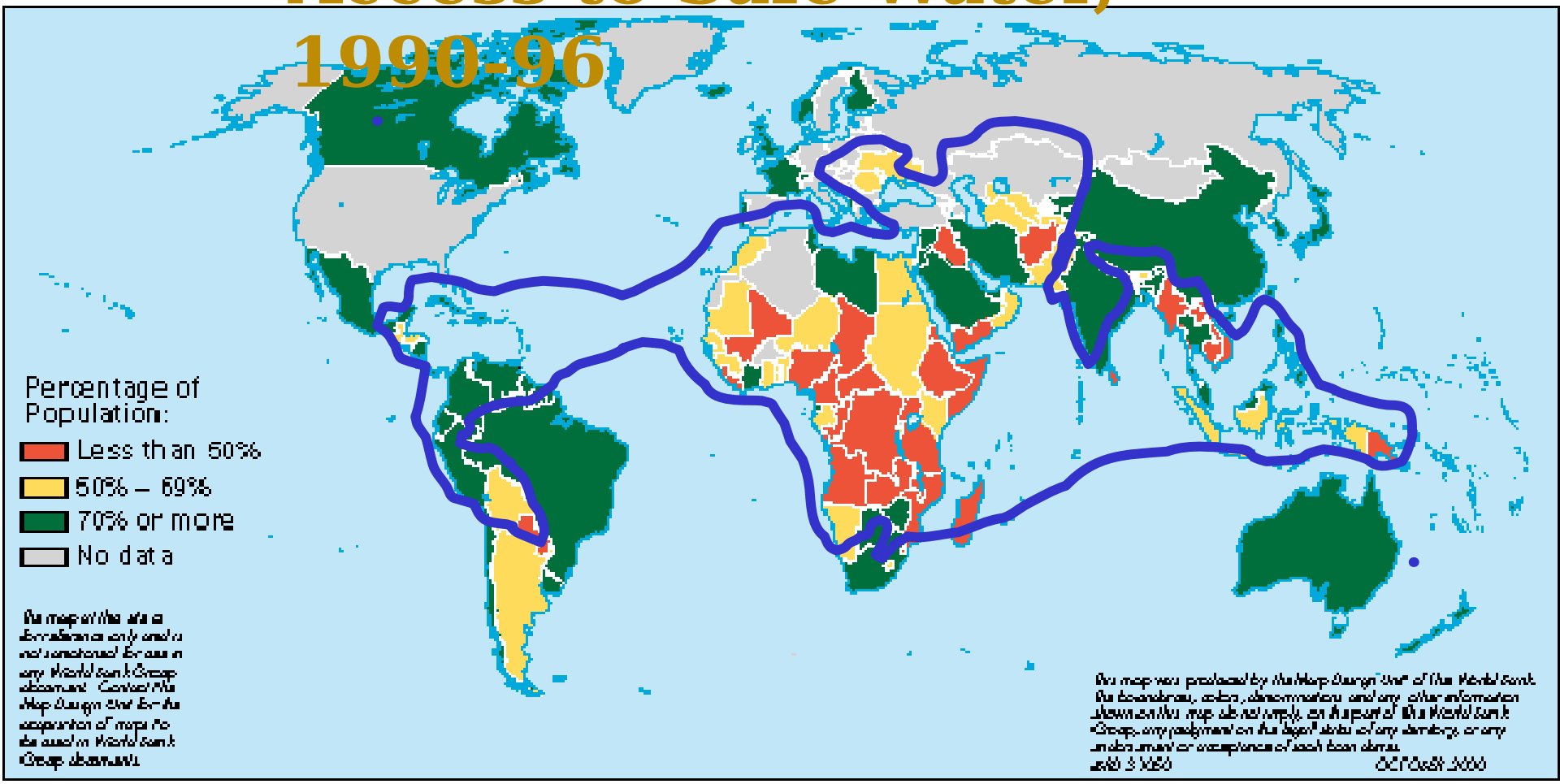
THE PENTAGON'S NEW MAP

IT EXPLAINS WHY WE'RE GOING TO WAR, AND WHY WE'LL KEEP GOING TO WAR.

BY
THOMAS P.M. BARNETT, U.S. NAVAL WAR COLLEGE
[MAPS BY WILLIAM MCNULTY]

From Esquire, March 2003 issue

Access to Safe Water, 1990-96



And now for a little friendly competition….with major awards involved!

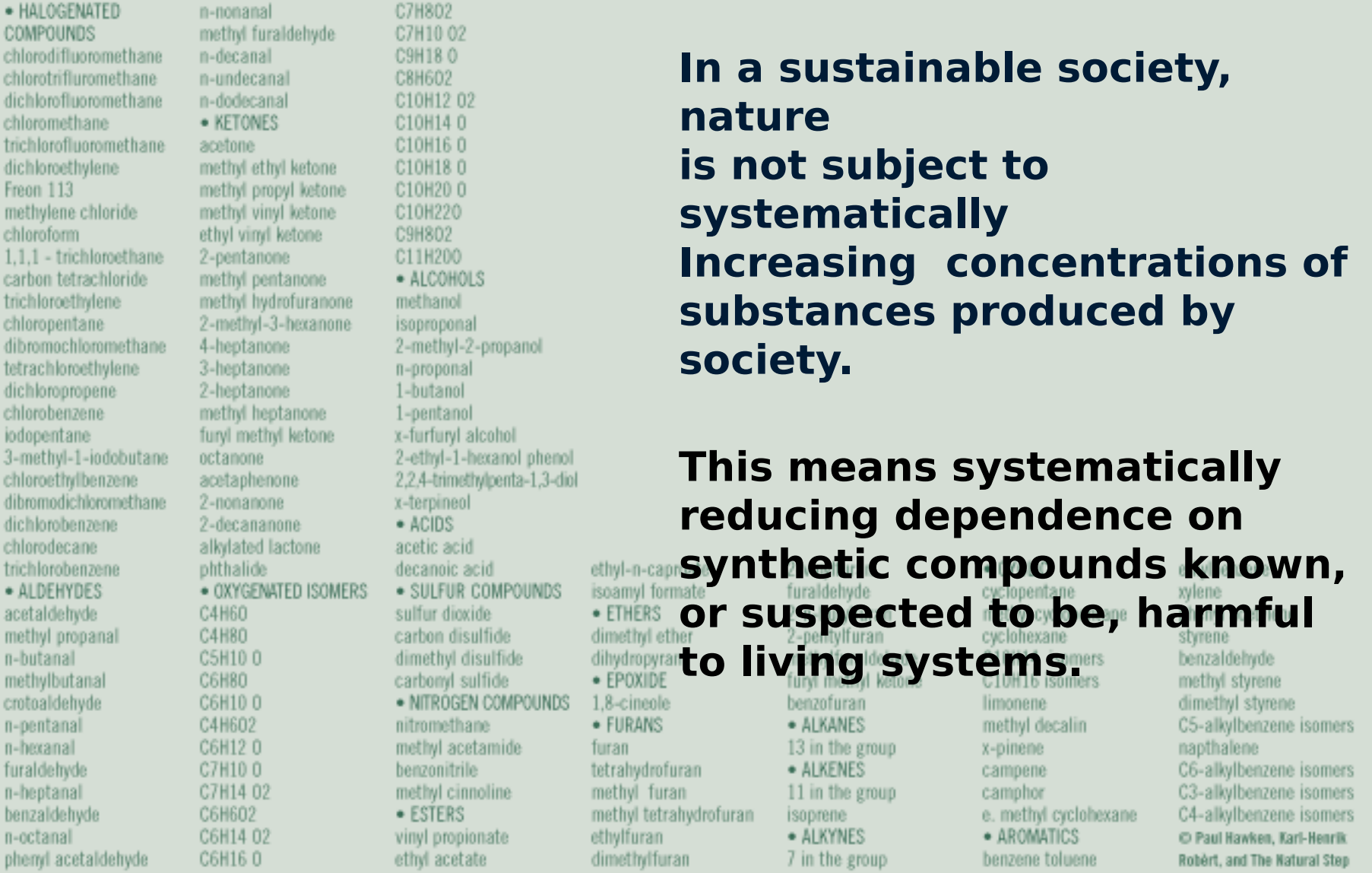
System Condition 1

In a sustainable society, nature
is not subject to systematically Increasing
concentrations of substances extracted from the Earth's crust.

This means substituting certain minerals that are scarce in nature with others that are more abundant, using all mined materials

System Condition 2

the NATURAL STEP



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benzaldehyde
n-octanal
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methyl furaldehyde
n-decanal
n-undecanal
n-dodecanal
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methyl vinyl ketone
ethyl vinyl ketone
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methyl hydrofuranone
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2,2,4-trimethylpenta-1,3-diol
x-terpineol
• ACIDS
acetic acid
decanoic acid
• SULFUR COMPOUNDS
sulfur dioxide
carbon disulfide
dimethyl disulfide
carbonyl sulfide
• NITROGEN COMPOUNDS
nitromethane
methyl acetamide
benzonitrile
methyl cinnoline
• ESTERS
vinyl propionate
ethyl acetate
ethyl-n-capr
isoamyl formate
• ETHERS
dimethyl ether
dihydropyran
• EPOXIDE
1,8-cineole
• FURANS
furan
tetrahydrofuran
methyl furan
methyl tetrahydrofuran
ethylfuran
dimethylfuran
furaldehyde
2-pentylfuran
furyl methyl ketone
benzofuran
• ALKANES
13 in the group
• ALKENES
11 in the group
isoprene
• ALKYNES
7 in the group
cyclopentane
cyclohexane
C10H16 isomers
limonene
methyl decalin
x-pinene
campene
camphor
e. methyl cyclohexane
• AROMATICS
benzene toluene
xylene
styrene
benzaldehyde
methyl styrene
dimethyl styrene
C5-alkylbenzene isomers
napthalene
C6-alkylbenzene isomers
C3-alkylbenzene isomers
C4-alkylbenzene isomers

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In a sustainable society, nature is not subject to systematically Increasing concentrations of substances produced by society.

This means systematically reducing dependence on synthetic compounds known, or suspected to be, harmful to living systems.

System Condition 3

In a sustainable society, nature is not subject to increasing degradation by physical means.

This means that the productive mechanisms of nature are not diminished in quality or quantity, and we must not harvest nature beyond its capacity to regenerate.

System Condition 4

In a sustainable society, basic needs are met worldwide.

This means using resources efficiently, fairly and responsibly, so that the needs of people on whom we have an impact (near and remote), and the future needs of people not yet born, stand the

Design Parameters for a Sustainable Society

1. You can't dig stuff out of the earth and spread it around indefinitely. (e.g. oil, coal, toxins)

2. You can't spread man-made stuff around in nature indefinitely (e.g. solvents, synthetic chemicals)

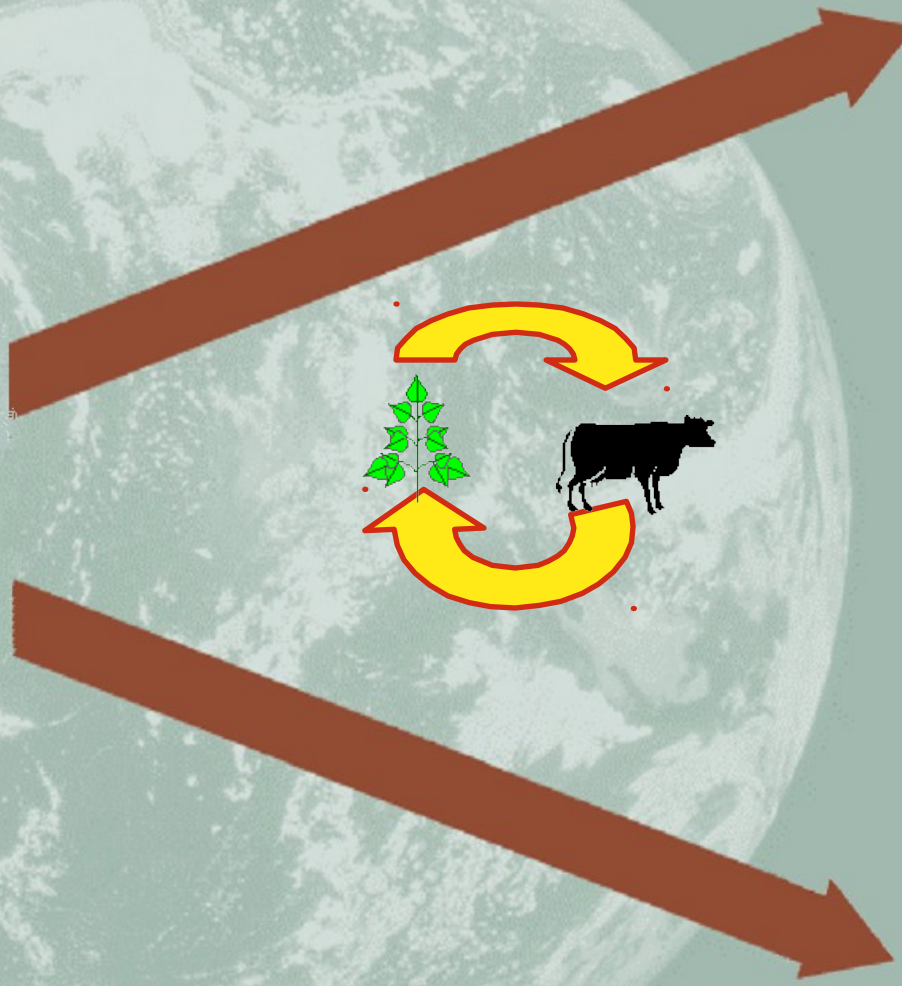
3. Don't erode nature's capacity to support life.

The Goal of Sustainability

SERO

life supporting resources **rising**

consumption of life supporting resources **declining**



So….what does all this mean to you as an environmental professional?

Sustainability – WHY?

SERO

- **An opportunity to engage leadership**
  - **Increase mission focus and relevance**
- **Establish common goals with colleagues**
  - **integrate environmental considerations into core business**
- **The next step forward in our profession**

So….what does all this mean to us…as citizens of the planet?

Sustainability in a Nutshell

SERO

Dancing with the TIGER
BELIEVING CASSANDRA
The Ecology of Commerce
Paul Hawken
THE NATURAL STEP FOR BUSINESS
WEALTH, ECOLOGY AND THE EVOLUTIONARY CORPORATION
BIOMIMICRY
Mid-Course CORRECTION
Cool COMPANIES
How the Best Businesses Boost Profits and Productivity by Cutting Greenhouse Gas Emissions
Joseph J Romm
Henry Ford Today and Tomorrow

Lessons Learned from the Business Community

- **We're on a collision course with nature … AND … there's a profitable way out**
- **Economic productivity, individual and community needs, and environment *<u>are interdependent</u>***
- **It's the <u>system</u>—Organizations need to understand their work as part of a complete system**
- **New/emerging technology greatly reduces environmental impact, at the same or better level of effectiveness.**

It’s the system!

Army Installation Sustainability Program

- **Long-range strategic program to ensure realistic training, combat readiness, and mission success**
  - ✓ **Discuss <u>significant</u> environmental impacts that threaten viability with local community**
  - ✓ **Establish 25 year strategic goals to reduce those impacts**
  - ✓ **Develop 5-year plans with objectives, targets, and resource requirements**

Design Parameters for a Sustainable Military Installation/Base

- **Optimizes military training/mission**
- **Provides for the well-being of soldiers and families**
  - ***Good facilities***
  - ***Strong cultural/community services***
- **Has a mutually-beneficial relationship with the local community**
- **Is life-cycle cost-effective to operate**
- **Sustains community/regional natural resources**
  - ***Uses renewable energy and biodegradable materials***
  - ***Operates within it's fair share of resources***
  - ***Restores/enhances ecosystems***

Installation Sustainability Program

"We will either set up this stuff now and work towards these goals… or I will set up my successors 10-15 years now for a certain fall. We won't do that."

LTG Hill
I Corps Commander,
Fort Lewis
7 Feb 02

“Where there is no vision,
people perish.”
Proverbs 29:18